

IN THE CLAIMS

1. - 49. (canceled)

50. (new) Method for determining in real time whether an air or a land vehicle is exposed to at least one selective source point of interest within a terrain, comprising the steps of:
pre-defining a compact size Digital Terrain Model (DTMO) by:

- a) providing a Digital Terrain Elevation Data (DTED);
- b) defining at least one selective source point of interest within said DTED;
- c) for each source point of interest within the DTED, defining a directional fan, said directional fan definition comprises a fan opening angle, a fan azimuth, a maximal range for terrain analysis, and a fan data set having an origin at a corresponding one of said source points;
- d) evenly dividing each fan opening angle into plurality of angular directions according to a fan angular resolution;
- e) for each of said fan angular directions, determining all DTED points along said angular direction which have a line of sight with the corresponding fan source point, and discarding all other DTED points in said angular direction which do not have a line of sight with said fan source point;
- f) for each of said determined DTED points along a same fan angular direction, defining a line of sight starting at the fan source point and:
 - if the point is not a peak point, ending at said point;
 - if the point is a peak point, ending at a terrain point beyond said point,
 - if exists, or at a point of space at said maximal range for the terrain analysis;

wherein the collection of all said lines of sight along a same direction form a corresponding directional data set of exposable heights;

- g) associating all the data sets of exposable heights of a same fan to a corresponding fan data set, all the separate fan data sets form the said DTMO; and in real time performing the following steps:
 - A. determining from a known x,y,z location of the vehicle the angular direction from the vehicle to said selective source point of interest, and selecting from the DTMO the fan data set which corresponds to that source point, and from said selected fan data set selecting the directional data set of exposable heights which corresponds to said determined angular direction;
 - B. determining from the known x,y,z location of the vehicle the range from the vehicle to said selective source point of interest;
 - C. from said selected directional data set of exposable heights and said range from the vehicle to the source point, determining whether the vehicle is above a respective line of sight at that range, and in the affirmative case, concluding that the vehicle is exposed to said source point, otherwise, concluding that the vehicle is not exposed.

51. (new) Method according to claim 50, wherein the collection of all the lines of sights within a fan data set defines an exposable envelope with respect to this fan source point.

52. (new) Method according to claim 50, wherein the angular direction from the vehicle to said selective source point of interest is the approach azimuth of said vehicle to said source point.

53. (new) Method according to claim 50, wherein the fan opening angle is defined based on visibility limitations.

54. (new) Method according to claim 50, wherein the fan angular resolution is determined according to the fan opening angle and the fan maximal range.

55. (new) A method according to claim 50, wherein terrain information is obtained from the directional fans via a lookup process.

56. (new) A method according to claim 55, wherein the terrain information which is obtained further comprises interpolation within an angular angle spanning two or more directional data sets of exposable heights of a same fan data set.

57. (new) Method according to claim 50, wherein the directional fan data set further comprises the DTMO maximal range, the fan opening angle, fan direction, maximal compression deviation, height of the source point, spatial location of the source point, and the respective lines of sight to those points having a line of sight to the source point.

58. (new) Method according to claim 50, wherein the maximal range for terrain analysis is infinity.

59. (new) Method according to claim 50, wherein the fan opening angle of at least one fan is 360°.

60. (new) Method according to claim 50, wherein the DTMO is a communication DTMO which comprises a single fan and a corresponding fan data set, and wherein the fan source point is a mission control center of the vehicle to which exposability is checked, to determine whether communication is possible.
61. (new) Method according to claim 50, for further finding, given a range of a vehicle to a selective source point, the bordering height of exposability to that source point at each direction to the source point.
62. (new) Method according to claim 50, further comprising compression of the DTMO data by applying a data transformation.
63. (new) Method according to claim 62, herein the data transformation comprises compression of the data relating to the lines of sight included within each directional data set of exposable heights, by merging plurality of lines of sights which fall within a predefined range of elevation angle to a single line of sight.
64. (new) Method for determining in real time whether an air or a land vehicle is exposed to a selected one of selective source points of interest within a terrain, comprising the steps of:

providing a Digital Terrain Model (DTMO) by:

- a) providing Digital Terrain Elevation Data (DTED);
- b) selecting one of said selective source points of interest within said DTED as a selected source point;
- c) defining a directional fan, said directional fan comprising a fan opening angle, a fan azimuth, a maximal range for terrain analysis, and a fan data set having an origin at said selected source point;
- d) evenly dividing said fan opening angle into plurality of fan angular directions according to a fan angular resolution;
- e) respectively determining for said fan angular directions all points within said DTED along said fan angular directions that have lines of sight with said selected source point, and discarding all other points within said DTED;
- f) ending for each of said determined points along each of said fan angular directions
 - if said determined points are not peak points, at said determined points, or;
 - if said determined points are peak points, at terrain points beyond said determined points or at points at said maximal range for terrain analysis,

wherein collections of said endings along each of said fan angular directions form corresponding directional data sets of exposable heights; and

- g) associating all said directional data sets of exposable heights of said directional fan into a corresponding fan data set forming said DTMO; and

in real time performing the following steps:

- A. determining from an x,y,z location of said vehicle an angular direction from said vehicle to said selected source point;
- B. determining from said x,y,z location of said vehicle a range from said vehicle to said selected source point; and
- C. determining from said fan data set and said range whether said vehicle is above said lines of sight and, in the affirmative case, concluding that the vehicle is exposed to said selected source point.